

Your Ref.: 71469/141224(110A-TW)

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Our Case No.: 838433

Appl. No.: 091111179

Present Stage: Primary examination

Type of the Notice: OA

Cited Reference: Y

[Translation]

SYLLABUS:

In the matter of patent application No. 091,111,179, the applicant is requested to submit the amended claims in triplicate plus NT\$ 1000 of government fee within sixty days from the next day of service of this notice. If the time limit is not observed duly, or the applicant does not agree to make an amendment in accordance with the instructions, a decision will be rendered based on the contents presently available*. (*TIPLO note: indicating that the application shall likely be rejected if the official instructions are not followed.)

EXPLANATION:

1. This Official Notification is issued according to Article 44-1 of the Patent Law, Article 28 of the Enforcement Rules of the Patent Law, and Regulations No.IP-LET-0918600118-0 promulgated on November 8, 2002. An official fee for amendment of NT\$ 1,000 shall be paid (if the specification and drawings are to be amended) or supplemented, a request form has to be filed in duplicate, along with the supplementary amended pages of the specification or drawings in duplicate (with the supplement or amended portions underlined) and clean-copy of the supplemented / amended pages of the specification or drawings in triplicate; and if this supplement or amendment results in discontinuity in the number of pages of the original specification or drawings, a complete set of the specification or drawings after supplement / amendment has to be submitted to this Office in triplicate).

2. After examination, this application is held as follows.

In existing plasma system, to let plasma distribute more uniform and work more normally, a voltage probe is used to detect the voltage used and the data of detected voltage are sent to a control system for controlling. For example, such a technical feature has been disclosed in claim 1 of Taiwan Patent Publication No. 308778 (referring to the attachment). The feature of this application resides in a processing method of plasma and a method of extracting an ion energy distribution function (IEDF)



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of plasma ions to improve the performance of the plasma processing system. Therefore, in claims 1-7, the device portions which do not possess the technical feature of this application should be deleted.

正本

經濟部智慧財產局 函

受文者：東京威力科創有限公司（代理人：林志剛

先生）

機關地址：台北市辛亥路二段一八五號三樓

傳真：（〇二）二七三五四三八五

如有疑問請電洽（〇二）二七三八〇〇〇七分機九〇三五

速別：速件

密等及解密條件：

發文日期：中華民國九十二年七月二十三日

發文字號：（九二）智專二（一）04074字第〇九二二〇七四二二六〇號

附件：

主旨：請於文到次日起六十日內，提出第〇九一一一一七九號專利申請案申請專利範圍修正本（頁一），送局憑辦，逾限或不同意補充、修正，本局即依原申請內容逕予審定，請查照。

說明：

一、依專利法第四十四條之一、專利法施行細則第二十八條及本局九十一年十一月八日智法字第〇九一八六〇〇一一八—〇號公告之規定辦理並繳修正規費新台幣一千元正（如有補充、修正說明書或圖式者，應備具補充、修正申請書一式二份，並檢送補充、修正部份劃線之說明書或圖式修正頁一式二份及補充、修正後無劃線之說明書或圖式替換頁一式三份；如補充、修正後致原說明書或圖式頁數不連續者，應檢附補充、修正後之全份說明書或圖式一式三份至局）。

二、本案經審查認為：現有的電漿系統，為了使它的分佈更為均勻，工作更為正常，通常都有電壓

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臺北市中山區南京東路二段一二五號七樓

林志剛 先生

雙掛

發文文號：09220742260

第一頁

裝

訂

線



探針來粹取當時的電壓，然後將粹取到的數據，交由控制系統來控制，如專利公告第308778號案（如附件），在其申請專利範圍的第1項中就已揭示。本案的特徵在處理方法及分佈函數的粹取之上，來確定一種離子能量的分佈函數（ IED ），用以改善電漿處理系統的性能，故本案應刪除申請專利範圍第1至7項未具有本案特徵之裝置部份。

正本：東京威力科創有限公司（代理人：林志剛 先生）

副本：

局長
蔡練生

依照分層負責規定
授權單位主管決行

File 351:Derwent WPI 1963-2003/UD,UM &UP=200376
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DIALOG(R)File 351:Derwent WPI
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010979466 **Image available**

WPI Acc No: 1996-476415/199647

Aliasing sampler probe for detecting plasma RF voltage and current - uses
sampling signal with sampling rate slower than RF fundamental frequency
selected to produce aliasing waveform at frequency that is several orders
of magnitude below RF frequency

Patent Assignee: ENI DIV ASTEC AMERICA INC (ENIA-N)

Inventor: KEANE A R A

Number of Countries: 011 Number of Patents: 009

Patent Family:

| Patent No | Kind | Date | Applicat No | Kind | Date | Week |
|-------------|------|----------|-------------|------|----------|----------|
| US 5565737 | A | 19961015 | US 95472433 | A | 19950607 | 199647 B |
| EP 753876 | A2 | 19970115 | EP 96301451 | A | 19960304 | 199708 |
| JP 8339896 | A | 19961224 | JP 96101851 | A | 19960401 | 199710 |
| TW 308778 | A | 19970621 | TW 96101704 | A | 19960212 | 199749 |
| KR 97004976 | A | 19970129 | KR 9620721 | A | 19960607 | 199808 |
| IL 117567 | A | 19981227 | IL 117567 | A | 19960320 | 199907 |
| CN 1156827 | A | 19970813 | CN 96106901 | A | 19960607 | 200139 |
| EP 753876 | B1 | 20011205 | EP 96301451 | A | 19960304 | 200203 |
| DE 69617549 | E | 20020117 | DE 617549 | A | 19960304 | 200213 |
| | | | EP 96301451 | A | 19960304 | |

Priority Applications (No Type Date): US 95472433 A 19950607

Cited Patents: No-SR.Pub

Patent Details:

| Patent No | Kind | Lan | Pg | Main IPC | Filing Notes |
|--|------|-----|----|-------------|---------------------------|
| US 5565737 | A | | 6 | H05H-001/24 | |
| EP 753876 | A2 E | | 6 | H01J-017/32 | |
| Designated States (Regional): DE FR GB IT NL | | | | | |
| JP 8339896 | A | | 5 | H05H-001/46 | |
| TW 308778 | A | | 4 | H05H-001/24 | |
| KR 97004976 | A | | | H05H-001/00 | |
| IL 117567 | A | | | H05H-001/24 | |
| CN 1156827 | A | | | G01R-019/00 | |
| EP 753876 | B1 E | | | H01J-017/32 | |
| Designated States (Regional): DE FR GB IT NL | | | | | |
| DE 69617549 | E | | | H01J-017/32 | Based on patent EP 753876 |

Abstract (Basic): US 5565737 A

In a plasma arrangement in which an RF power generator produces an RF electrical wave at a predetermined RF frequency and containing harmonic information which affects the form of the RF wave, the electrical wave being supplied through an RF matching network to a power input of a plasma chamber within which the electrical wave produces a plasma. A detector samples the RF electrical wave at the input to the plasma chamber to determine a measurement of the RF electrical power applied to the plasma chamber.

The detector includes a sampling device for sampling the amplitude

of the RF wave at a predetermined sampling rate lower than the predetermined RF frequency, and device for synthesising the sampled amplitude to produce an aliasing waveform at a predetermined aliasing frequency significantly lower than the predetermined RF frequency, in which the aliasing waveform preserves the harmonic information of the RF wave.

ADVANTAGE - Aliasing replicas preserve phase and harmonic information with accuracy that is not available from other sampling techniques.

Dwg.1/4

Title Terms: ALIASING; SAMPLE; PROBE; DETECT; PLASMA; RF; VOLTAGE; CURRENT; SAMPLE; SIGNAL; SAMPLE; RATE; SLOW; RF; FUNDAMENTAL; FREQUENCY; SELECT; PRODUCE; ALIASING; WAVEFORM; FREQUENCY; ORDER; MAGNITUDE; BELOW; RF; FREQUENCY

Derwent Class: U11; V05; X14

International Patent Class (Main): G01R-019/00; H01J-017/32; H05H-001/00; H05H-001/24; H05H-001/46

International Patent Class (Additional): C23F-004/00; G01N-021/73; G01R-019/255; G01R-021/133; G01R-031/24; H01L-021/3065; H03B-019/00; H05H-001/36

File Segment: EPI

(11)公告編號: 308778

(44)中華民國86年(1997)06月21日

發 明

全 4 頁

(51)Int. Cl. 6: H05H1/24

(54)名 稱: 電漿探針偵測之取樣器

(21)申 請 案 號: 85101704

(22)申請日期: 中華民國85年(1996)02月12日

(72)發 明 人:

安東尼·基亞尼

美國

(71)申 請 人:

雅美公司伊恩艾分公司

美國

(74)代 理 人: 黃香 先生

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[57] 申請專利範圍:

1. 一種電漿裝置, 在該電漿裝置之中, 一個射頻電源產生器以一預定的頻率產生射頻電波, 前述的電波經由一射頻匹配網路被輸送到一電漿室的電源輸入口, 在該電漿室內部, 前述的電波產生出電漿, 以及, 在該電漿裝置之中, 偵測裝置在前述電漿室的入口處對該射頻電波, 採取其樣本, 以判定被施加到前述電漿室的射頻電源之量測值; 其特徵在於: 前述偵測裝置包含有取樣裝置, 該取樣裝置以預定的取樣速率取樣前述射頻電波的振幅, 並連結一合成電路, 結合所取樣的振幅, 以預定的疊合頻率, 產生疊合波形, 該疊合頻率明顯低於前述產生射頻電波的預定頻率, 又, 該取樣速率低於前述產生射頻電波的預定頻率。
2. 如申請專利範圍第1項所述之裝置, 更進一步的特徵在於: 前述的射頻電源產生器以前述的預定頻率 F 產生前述的射頻電波, 前述預定的疊合頻率被選擇為 f_a , 且前述的取樣速率 f_s 被選擇為 $f_s = F/N + /-f_a/N$ 其中, N 是一個大於1的整數。
3. 如申請專利範圍第2項所述的裝置, 更進一步的特徵在於: 前述預定頻率 F 為 13.56MHz, 前述疊合頻率 f_s 約為 50KHz 至 250KHz 的大小。
4. 如申請專利範圍第2項所述的裝置, 更進一步的特徵在於: 前述的整數 N 至少是5。
5. 如申請專利範圍第1項所述的裝置, 更進一步的特徵在於: 前述取樣裝置包含:
 - 一個取樣時鐘, 該時鐘以前述的取樣速率操作,
 - 一個第一高速取樣與保持裝置, 該裝置係由前述的取樣時鐘操作, 以取樣前述射頻電波的電壓,
 - 一個第二高速取樣與保持裝置, 該裝置

係由前述的取樣時鐘操作，以取樣前述射頻電波的電流，以及
前述的合成裝置包括有產生疊合電壓波形和產生疊合電流波形的裝置。

6. 如申請專利範圍第 5 項所述的裝置，更進一步的特徵在於：前述第一和第二取樣和保持裝置，分別包含一個 A/D 轉換器，該轉換器能夠產生至少 12 位元寬度的數位樣本。
7. 如申請專利範圍第 6 項所述的裝置，更進一步的特徵在於：前述的第一和第二取樣與保持裝置對於相伴生的電壓和電流波形同時進行取樣。
8. 如申請專利範圍第 6 項所述的裝置，更進一步的特徵在於：前述的第一和第二

數位門鎖機構分別聯結於前述的第一和第二取樣與保持裝置和一數位訊號處理器的個別輸入口之間。

圖示簡單說明：

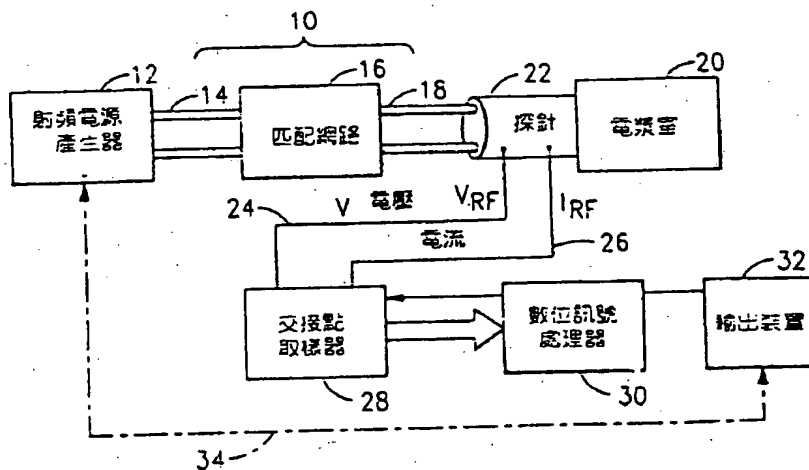
5. 圖一係射頻電漿裝置的方塊圖，該射頻電漿裝置包含有根據本發明較佳實施例的射頻電源產生器、阻抗匹配網路、電漿室、和射頻電源探針。

10. 圖二係本發明之探針實施例的交接點取樣部份的簡化示意圖。

圖三 A 至圖三 C 係解釋本發明實施例裡施加的射頻電源波形、取樣脈衝、和所取得樣本的振幅數值。

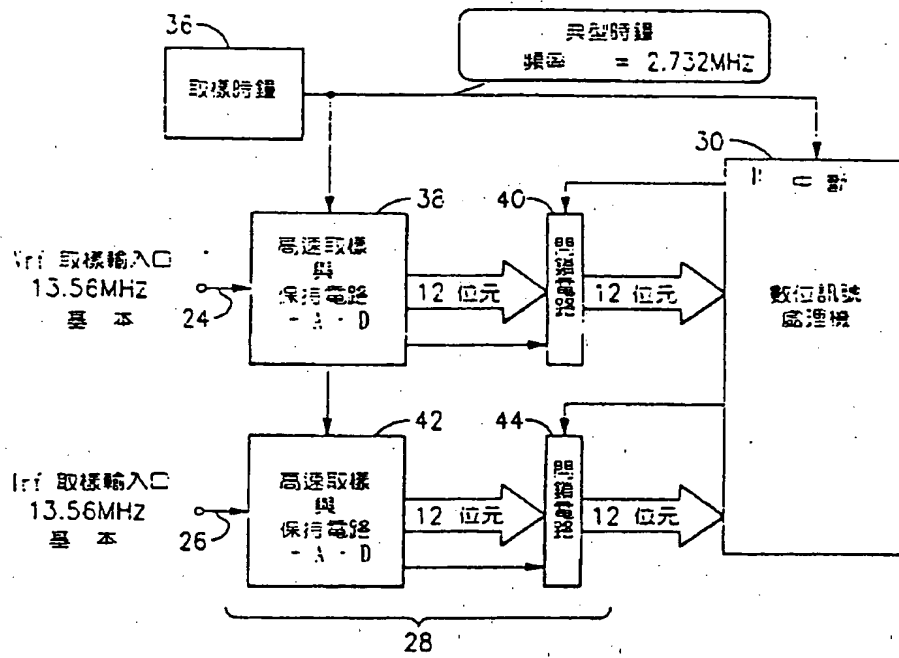
圖四係本實施例產生的重疊波形。

15.

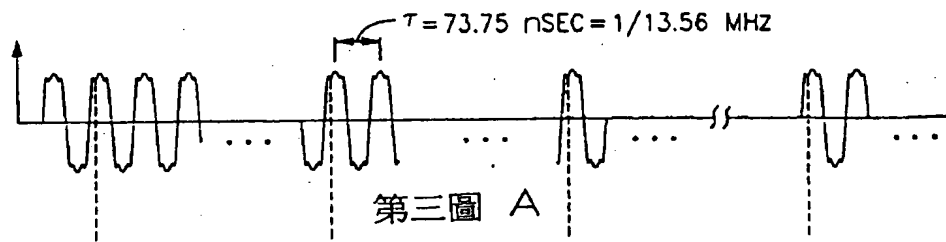


第一圖

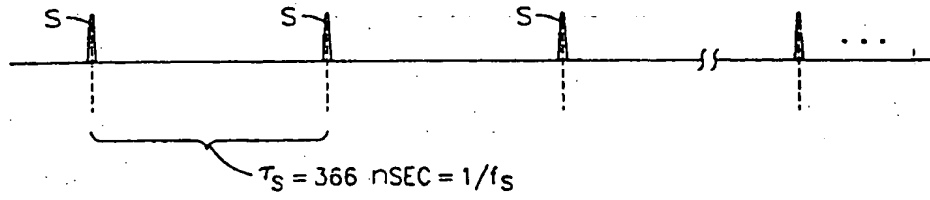
(3)



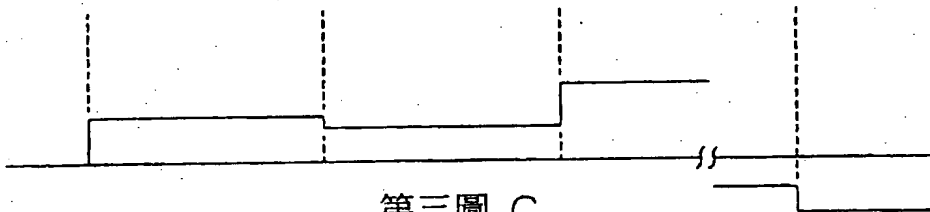
第二圖



(4)



第三圖 B



第三圖 C

第四圖

